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THE CARE OF THE EYES AND EARS

By

Richard H. Lewis, M. D.

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THE

CARE OF

THE EYES AND EARS.

BY

RICHARD H. LEWIS, M. D.,

MEMBER OF THE STATE BOARD OF HEALTH, AND SURGEON FOR DISEASES OF THE EYE, EAR, AND THROAT TO ST. JOHN'S HOSPITAL, AND TO THAT OF THE LEONARD MEDICAL SCHOOL, RALEIGH, N. C.

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WILMINGTON, N. C.:
PUBLISHED BY THE NORTH CAROLINA BOARD OF HEALTH.
1886.

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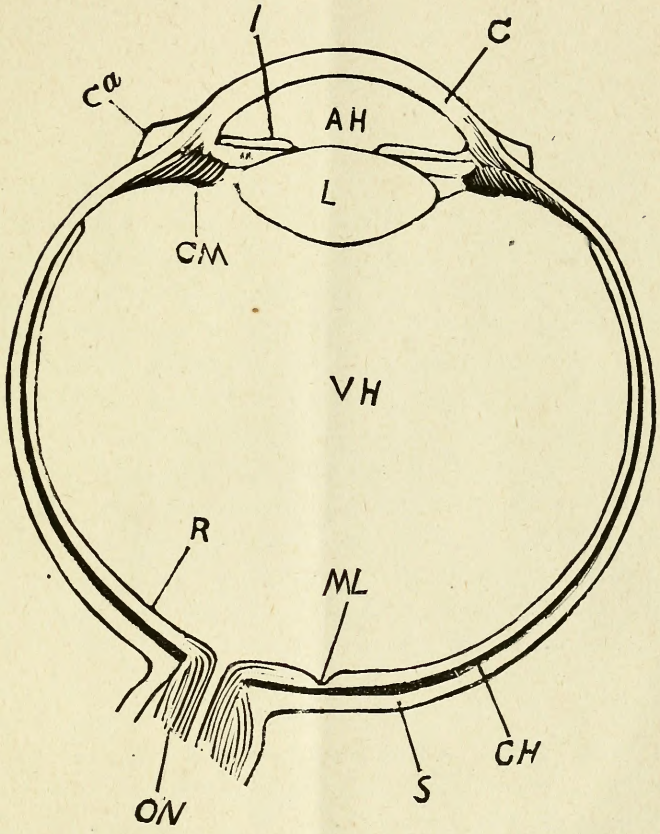
DIAGRAM OF THE EYE IN HORIZONTAL SECTION.



S, sclerotic coat; CH, choroid coat; R, retina, or nervous coat, continuous with ON, the optic nerve; ML, Macula lutea, or yellow spot, the centre of retina; VH, vitreous humor; L, lens; AH, aqueous humor; I, iris; CM, ciliary muscle; C, cornea; Ca, conjunctiva.

PREFACE.

THE object of this article, prepared at the request of the State Board of Health, is to assist, as far as may be, in preserving in a condition of health and usefulness the most important of the senses.

Eyesight stands easily first in the estimation of all, and Hearing is only second to it. Blindness being one of the most frequent causes of pauperism, it becomes still more the duty of the guardians of the public health to present to the people such information as may help to prevent its occurrence than a regard simply for the happiness and prosperity of the individual would require. But there are so many instances of damage to, and loss of, one or the other of these precious senses when they might have been saved by the knowledge of a few simple facts, that there is no need to mention the relief of the community of a pecuniary burden to show the necessity for such a publication.

This, then, being intended for those not at all versed in medicine, must be as free as possible from the technicalities in which the professional man is accustomed to think, and at the same time as brief as possible in order to come, together with other necessary publications, within the resources of the Board for printing. The difficulties of the task are greatly increased by these conditions, but it shall be my endeavor to be as plain and simple as possible, and at the same time as concise as a regard for clearness will permit. I trust the kind reader will bear these facts in mind.

217 N. WILMINGTON ST.,
Raleigh, N. C., May 12, 1886.

THE CARE OF THE EYES.

In order to understand and appreciate instructions as to the proper method of caring for any organ, it is absolutely necessary to have some idea of the nature of that organ. We must therefore, before going farther, study for a few minutes the structure of the eye. Reference to the diagram in front will assist greatly in understanding what follows.

The eye is a nearly round ball about seven-eighths of an inch in diameter. The walls of the posterior five-sixths of this globe are made up of three thin coats, lying one immediately upon the other like the layers of an onion. The interior of this part is filled with a rather thick, viscid, but perfectly transparent fluid called the vitreous humor. The outermost of these three coats or layers is a dense opaque membrane named the *sclerotic*, fibrous in structure, something like the tendons or "leaders," and therefore very strong and tough. Its purpose is to preserve the shape of the ball and to protect the more delicate structures within. This constitutes "the white of the eye." Next to that is the middle coat, or *choroid*, which is composed of a network of blood-vessels, in the meshes of which is deposited a kind of dark pigment or coloring-matter, the object of which is to prevent dazzling from bright light. The eyes of albinos are very sensitive to light, owing to the absence of this coloring-matter in this coat as well as in the hair. At its front border this coat is thickened by the addition of another element, the ciliary muscle, or muscle of accommodation—a structure of great interest and importance to us. Interior to this is the third and innermost layer, called the *retina*. It may for our purposes be considered an expansion of the optic nerve, which, coming from the brain, perforates the first two coats and then spreads out into this nervous layer, "like the cup of a tulip on its stem." This is the sensitive plate on which the pictures of all objects seen are taken.

The front of the eyeball is quite different from that portion we have been considering. The first thing we notice is a perfectly transparent structure (the remaining one-sixth of the whole ball), which appears

to be part of a smaller globe, and which seems to be set in the white of the eye like a watch-crystal in its rim. This is the *cornea.* Just back of that we observe a very beautiful curtain, which, on account of its infinite variety of colors in different individuals, is called the *iris*—that word meaning a rainbow. Near the centre of this curtain is a round black spot which is often referred to in common language as "the sight of the eye." This is merely a window or opening in the curtain, the *pupil,* through which light enters the eye and out of which we see. This window partially opens and shuts automatically in order to regulate the amount of light. The space between the iris and the transparent cornea is filled with a watery fluid, the *aqueous humor.* Immediately behind the iris, suspended in a little sac, is the *crystalline lens.* It is convex or bulging, both in front and behind, and its function is to make pictures on the retina of all objects before the eye.

Covering all of the white of the eye that can be seen, and leaping from that over to the lids and lining their under surfaces, becoming continuous with the skin at their edges, is an exceedingly thin, transparent mucous membrane called the *conjunctiva.* It is this membrane which is involved in ordinary simple inflammations of the eye. It is lubricated by tears manufactured for the purpose by the lachrymal gland at the upper and outer corner, the surplus being carried off by two little gutters in the inner ends of the two lids which open into a larger drain emptying into the nose. Each eye is moved in different directions by six little muscles, but the only ones of special interest to us are the two inner straight muscles, that are attached one to the outside of each eye next the nose, which converge the two eyes upon near objects.

For the sake of clearness we will make two general divisions of our subject, and consider the eye first in its relation to weak sight; and secondly in its relation to blindness, although they will overlap one another at certain points.

Weak Sight.

Weak sight is that condition of affairs in which, while there is no evidence of disease, the eyes are nevertheless unequal to the performance of their legitimate work. The acuteness of sight for ordinary distant objects is sometimes below the standard, and sometimes not, but, whether it be or not, any continuous effort at *near* work, as reading, writing, sewing, etc., is impossible, and always brings on a certain characteristic group of symptoms. First, a heavy, tired feeling in and around the eyes is observed, and then the letters or stitches become

indistinct. After a rest of a minute or two, they can be again seen plainly, only to become blurred even more and in a shorter time than before. A repetition of these attempts causes pain and watering of the eyes with redness of the balls and edges of the lids, often headache, and, in some cases, a disturbance of the general health, more especially the nervous functions. If attended to promptly, it can nearly always be easily relieved; but if it be neglected and nothing done for it, perseverance in near work is liable to cause such sensitiveness and irritability of the eyes as to render them not only practically useless, but a constant source of annoyance and discomfort in the ordinary lights we must daily encounter. It is exceedingly common (and through heredity becoming more so every day), and, while not productive of blindness, interferes seriously with the practical use of the eyes, as we have just said. It is, moreover, very often met with in the young during school-life, when it prevents their studying with ease and comfort, if they can at all, and by so doing obstructs the formation of the *habit* of study, which in the average boy demands every encouragement, thereby affecting injuriously the character, probably for life. Such being the case, and the remedy for these troubles being very simple and easily applied when once they are recognized and their true nature appreciated, the Board of Health regards it as of prime importance that the public should be put in a position to recognize and appreciate them.

Advice to intelligent people is much more apt to be taken if accompanied by the reasons for it, and they are, besides, much more likely to be interested in a subject if it can be explained and made clear than they would be in a mere didactic statement of bald, unillustrated facts. Therefore, as interest in these important matters on the part of the people is what the Board is especially anxious to create, I shall endeavor to elucidate the subject in as simple a manner as possible.

Weak sight—asthenopia, as it is technically called—is sometimes due to a weak and irritable condition of the nervous apparatus of the eye pure and simple; and this form occurs most frequently in young women, who are peculiarly prone to functional nervous disturbances. But in a vast majority of instances it is caused by an *overstrain of the muscles* of the eye, either those which adjust each eye for objects at different distances, or those which turn both eyes in upon near objects. This overstrain may be, and sometimes is, due to simple weakness of these muscles, as often occurs during convalescence from severe attacks of illness, in which cases it is only temporary; but it is nearly always a consequence of the faulty shape of the ball, causing certain optical defects or errors in refraction, as they are usually called.

In order to understand these optical defects it is necessary to first understand what is a correct eye, and how we see with it. The knowledge of a few facts in regard to the nature of a convex lens will render this easy.

A convex lens is a body of some transparent material, usually glass as we see it, flattened from side to side, thicker in the middle than at the edges, with its faces having the curvature of part of a sphere or round ball. A familiar example is an ordinary magnifying- or sun-glass. Its peculiar property is that rays of light emanating from any object, after passing through it, are brought together again in the same relation to one another as they started from the object, and a picture or image of it is thereby produced. The point at which this union is effected is called the *focus* of the lens. The *more convex* the lens, the stronger it is and the *shorter* is its focus. The action of a convex lens can be interestingly illustrated in this way: Having closed all the doors and windows of the room except one in order to shut off the side lights, take a magnifying-glass—or, if not convenient, the spectacles of the oldest person in the house, they being convex lenses—and, holding it immediately opposite the window about three feet from the wall, gradually approach it thereto, and you will presently see come out on the wall a distinct picture, turned upside down, of the sky, trees, and other objects outside.

If you will turn to the diagram of the eye, you will recall that the lens is situated immediately behind the iris and opposite the pupil, and that the sensitive retina is the coat nearest to it, being the innermost of the three. Now, as the convex lens of glass held opposite the window of the darkened room makes a picture of outside objects on the wall, just so does the convex lens in the dark chamber of the eye placed opposite the only window, the pupil, make a picture of outside objects on the retina, which in the normal eye is exactly at its focus. The impression thus made upon the retina is transmitted to the brain by the optic nerve, and the act of vision is complete.

In what has been said about rays of light reference has been had only to rays from *distant* objects, which are always practically parallel to one another. It is an optical fact that rays emanating from objects nearer than twenty feet sensibly diverge from one another, and that the nearer the object the more divergent they are. A lens having only so much power to concentrate light, it is evident that divergent rays cannot be brought to a focus as soon as parallel; in other words, that their focus must be farther from the lens. This being true, how is it that we see near objects distinctly, as the retina cannot be set back to this new

focus? By an increase in the thickness or convexity of the lens, which, as you remember, *shortens* the focus. This is what is called the accommodation of the eye, and it is effected in the following manner: The inherent tendency of the lens-substance, which is exceedingly elastic, is to assume a more globular form, but, enclosed in a sac, it is suspended or swung in the larger concentric circle made by the ciliary muscle by means of a connecting band (see diagram), and as long as the muscle is at rest the sac is kept upon the stretch and the lens more or less flattened. As soon, however, as the muscle contracts, being a ring, it must become smaller, and in so doing necessarily slacks the sac, thereby allowing the lens to follow its natural bent and bulge more in the middle. This is clearly shown in Fig. 1, where one half represents

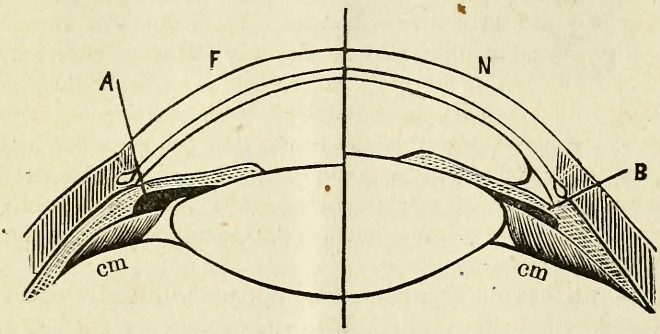


FIG. 1.

the position of the parts when the eye is at rest or adjusted for distance, and the other half when the muscle has contracted and it is adjusted for near objects. It will be observed that the edge of the lens is nearer to the muscle in the latter, and that therefore the suspensory ligament or band must be slacked.

In this way each separate eye is accommodated for different distances, but, as we always use the two eyes together, the adjustment is not complete unless they are both fixed upon the object. This convergence is made by the inner straight muscles attached to the sides of the balls next the nose, and the nearer the object of course the more must the eyes be turned in.

Thus we see that the adjustment of the eyes for near objects is accomplished by a *muscular effort* on the part of two sets of muscles, and that the *nearer* the object the *greater* the effort required of both, so that there is always a harmony of action between the two. If you will look steadily at a pencil or your finger held less than six inches

from the eyes, you will be distinctly conscious of this effort, which if kept up becomes painful; but at the ordinary distance of ten or twelve inches it is not perceptible in eyes of the proper shape. But variations from this proper shape are exceedingly frequent, and, as said before, defects in form are nearly always at the bottom of weak sight. They are of three kinds. In Fig. 2 the line X Y represents the retina in a

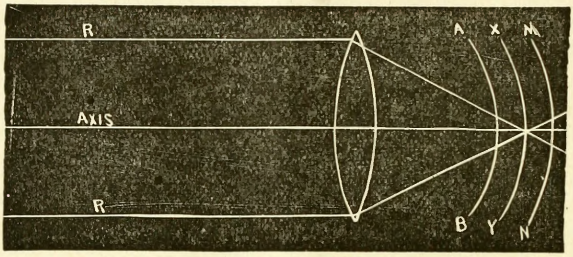


FIG. 2.

normal eye at the proper distance from the lens, but the eye may be too short, with the retina too close to the lens, A B, causing *over-sight* or *far-sight*; or it may be too long, with the retina too far from the lens, M N, causing *near-sight* or *myopia;* or the clear front, the cornea, may be irregular in its curvature, producing what, for want of a common name, will have to be called by the technical term of *astigmatism.* An easy way to remember these errors is to bear in mind that the short eye has long sight, and the long eye short sight, while the astigmatic eye does not have good sight at any distance.

Over-sight or *Far-sight* is by long odds the most common of these optical defects, certainly in this country, and it is therefore the most frequent cause of weak sight. But how does it cause weak sight? you will ask. By adding to the strain upon the accommodation. In the normal eye, the retina being exactly at the focus of parallel rays (X Y, Fig. 2), no effort whatever is required for distant vision, and the accommodation for near objects can be made without trouble; but in the short eye (A B) the focus must be shortened even for distance, and consequently just that much work must be added to what is usually required of the little muscle; and that is too much for it, so it breaks down, and we have precisely what we would expect from muscular fatigue—viz. the sense of weariness and heaviness about the eyes, the recurring dimness of the letters, the aching, and other symptoms characteristic of weak sight. Therefore, upon the occurrence of these symptoms we would suspect the presence of over-sight, especially if

distant vision were perfect (which would exclude near-sight and astigmatism), although it is not perfect in the highest degrees of over-sight itself, because in them the ball is so very short that it is beyond the power of the muscle to bring up the focus of even parallel rays to the retina. Such cases, however, are comparatively rare. Another effect of this over-sight is that the harmony of action between the two sets of muscles used in adjusting the eyes, accommodation and convergence, is destroyed, and as a result we frequently have crossed eyes, this being the cause in over 75 per cent. of such cases.

The remedy is simple and—if applied early before the eyes become chronically irritable—sure. Everything necessary to be done is to shorten the focus of the lens in proportion to the shortness of the eye, so as to do away with all extra effort—that is, all effort for distance—and put the eye on an equality with the normal eye. This is easily done by adding on another convex lens of the proper strength in the shape of spectacles.

Near-sight or Myopia is a subject of peculiar interest to the custodians of the public health. It is just the opposite, optically, of far-sight or over-sight, and, while the conditions causing the latter are always congenital, in near-sight they originate, as a large number of investigations show conclusively, between the ages of six and sixteen, or during school-life—rarely before and rarely after that period.* Heredity exerts a powerful influence in its production, a considerable proportion of the children of one near-sighted parent being apt to develop it, but it is very often acquired when there is no predisposition to it. When once established it is incurable. *It can to a large extent be prevented by proper care* on the part of parents and teachers during the period named. I shall therefore, as the representative of the Board of Health in this matter, endeavor to set forth clearly the true cha-

* It appears from the German statistics that the percentage of myopia, beginning with less than one half of 1 per cent. during the first half year of school-life, increased gradually from year to year to over 60 per cent. on an average in the highest class, in one instance going as high as 79 per cent. The Germans, however, are a peculiarly near-sighted race, and in this country the percentage of short-sight is only about half as great. An interesting result of the American observations is the fact that myopia is very rare among the negroes; all of which demonstrates in a general way the influence of literary culture and of heredity in the causation of this trouble. The investigations further show that the development of near-sightedness is in a direct ratio to the prevalence of the unfavorable conditions referred to in the text, and that it increases in degree, after it has once started, from year to year.

racter of the affection, with the means of its prevention, in order to save our people as far as possible from becoming any more "bespectacled" than is absolutely necessary.

As mentioned above, near-sight is due to an elongation of the eyeball displacing the retina backward, so that parallel rays come to a focus in front of it, and only divergent rays—from near objects—come to a focus exactly on it, and they only, therefore, can be distinctly seen; so that the causes of short-sight are to be found in everything that has a tendency to increase the length of the ball.

Merely mentioning the fact that anything injurious to the general health, by weakening the resisting power of the tissues of the eye in common with those of the rest of the body, assists in producing this elongation, and calling attention especially to the execrable ventilation of many school-rooms as a most active agency in this category, I will point you particularly to those causes acting directly through the eye itself.

It is now regarded as an established fact that the continued tension of the muscles of adjustment (accommodation and convergence) is the principal factor in the production of near-sight; and, it having been explained above that the nearer the object to the eyes the greater the tension or strain upon both these sets of muscles, it follows that everything having a tendency to cause the undue approximation of objects on which the eyes are continuously used during childhood assists in the origination of this condition. I say "in childhood," because, as we have seen, it nearly always begins during that period; and it does so for the reason that the tissues of all growing and immature animals are more soft and yielding than when they have attained the firmness of maturity—another reason for special attention to their general health at this time.

Since a large part of childhood, and particularly that part of it in which the eyes are used most on near objects, is passed in the school-room, it is there that we would naturally seek the causes of this trouble. And it is there that they are generally found. School-children are often compelled to hold their books too near—that is, nearer than ten inches—because the amount of light is insufficient. This question of plenty of light of good quality (the best is direct from a northern sky) in the school-room is of the highest importance, and cannot be impressed too deeply upon those having such matters in charge. In a general way, it may be said that there should always be enough light to enable a child to read on a moderately clear day fine print in the darkest corner of the room at the distance of a foot. And the direc-

tion from which it comes is also important. Preferably, it should come from the left and above, so that, while illuminating the page, it may not fall upon the eyes nor cast a shadow of the hand in writing. The next best direction is from behind, then from the right, but never from in front. The children should always look at a dead wall. I append an admirable statement of the "Requirements of the Model School-room,"* copied in the *Sanitarian* for October, 1885, from *City School Systems of the United States*, and earnestly commend it to all school boards and others having in charge the building of school-houses. It

* "REQUIREMENTS OF THE MODEL SCHOOL-ROOM.

"(1) *Shape.*—It should be oblong, the width being to the length about as three to four, with the teacher's platform at one end.

"(2) *Size.*—For primary or grammar school, with register of 54 pupils and attendance of about 50, the room should be about 33 feet long, 25 wide, and 13 high, which gives practically upward of 200 cubic feet of air and 16½ square feet of floor-space to each pupil.

"(3) *Lighting.*—Four windows on the left of the pupils as they sit, the tops being square and not more than six inches from the ceiling, the bottoms being at least three and a half feet from the floor, equally spaced, not grouped, with transom sashes hung at the base above the sliding sashes. A window or two in addition at the back is admissible. The size of the windows on the side, taken collectively, should equal at least one-sixth of the floor-space. The highest authorities in school hygiene require 300 or 350 square inches of glass for each pupil.

"(4) On the side opposite the windows two doors, with transom windows above hung at the base, and between these transom windows, and on the same line, two more windows of the same kind and hung in the same manner.

"(5) The wall should be slightly tinted, but not the ceiling.

"(6) A black-board may be between the doors, but a sliding black-board back of the teacher's platform, or a portable one on the platform, in accordance with the German idea, would perhaps be better than the profusion of wall black-board now in vogue among us.

"(7) *Location of Seats.*—The main rule to be observed in the placing of the seats is to carry them as far as possible toward the window side of the room, and as far as possible from the opposite side; the aim being to make the arrangement such that the distance of the outer row of desks from the windows shall not exceed once and a half the height of the top window from the floor."

Proper height of seats and desks for different ages, as approved by the Boards of Health of New York and Chicago:

From	7 to 9	years,	top of desk	23	inches,	front of seat	12¼	inches.
"	9 to 11	"	"	"	24	"	"	"	12¾	"
"	12 to 14	"	"	"	25¾	"	"	"	14	"
"	15 to 18	"	"	"	27½	"	"	"	15¼	"

need not be more expensive than the ordinary plan, except in the matter of windows; and I am sure no one will grudge the children under his care in this respect the very slight additional cost necessary to supply them with light enough for the comfortable and *safe* use of their eyes.

The light being sufficient, the print may be bad or too small, though this danger has now been largely eliminated by the spread of knowledge on this subject and the active competition of publishers.

Sometimes the proportion between the height of the seat and that of the desk is such as to bring the book too near, as a low seat with a high desk.

Occasionally the seat has no back, so that from sheer fatigue the child is constrained to lean forward on the desk to rest himself.

Any of these things may cause this dangerous approximation, and not infrequently it is made more hurtful by a system of instruction which requires it to be kept up continuously for hours at a time.

The approximation of the book to too near a point is dangerous, because, as we have seen, it necessitates a strain upon the muscles of adjustment. That strain excites an increased flow of blood to the eyes to furnish the power for the extra work. The increased amount of blood causes dilatation of the blood-vessels and congestion, which conduces to the softening and degeneration of the coats, especially of the outer, tough, white coat, whose peculiar function is to preserve the shape of the ball. At the same time it has a tendency to augment the volume of the humors within the eye. This increase in the humors adds to the pressure from within outward, causing the softened coats to give way or bulge slightly at their weakest point, which is at the back, around the entrance of the optic nerve. But the principal factor, probably, in the production of the bulging is the squeezing of the ball by the muscles which move it, as they are put greatly upon the stretch when the eyes are turned in much. The walls, having once begun to give way, become thinner and less able to resist, and, the same causes continuing to act, the near-sight is apt to increase. If the bulging extend beyond a certain point, the two inner and more delicate coats become very much damaged, and sometimes destroyed, by the excessive stretching. Occasionally the retina, unable to follow farther, is detached from the coat lying under it, and then total destruction of sight is only a matter of time. So that short-sight is nearly always accompanied by a *diseased condition*, often progressive in character, that may, and not infrequently does, end in blindness, making our duty to give warning of its dangers the more imperative.

It is the duty of the teacher to see to it that the faulty conditions as to light, etc. above indicated are corrected, so far as lies in his power. He should, besides, make it a point to frequently interrupt the studies by various appropriate exercises (now common in well-managed schools) which will permit a rest of the eyes, and by frequent recesses. Parents also should exercise supervision in these matters at home, and in addition to carrying out the instructions given under the head of "General Directions," they should forbid too much study and reading, especially if their children be precocious and disposed to be bookish, and encourage them to outdoor life. This is often the more urgent because such children are apt to be feeble and delicate in constitution.

Owing to the presence of disease in so many near-sighted eyes, they are very often sensitive, irritable, and painful. The ordinary symptoms of weak-sight too are frequently complained of, even when the morbid changes are not very marked, they being due to the overstrain of the muscles of convergence, caused by the necessity of holding the book too near in order to make out the letters.

Attention to the presence of this defect will most likely be called by the child's inability to read figures on the black-board or in some similar way. Either a *high* degree of over-sight or the irregular error, astigmatism, may cause this as well as short-sight, but the difference between them and the true myopia is that in the last the sight for objects held near enough is generally unusually acute, while in the first two it is apt to be more or less proportionally bad at all distances.

When once the fact becomes known, the eyes should be scrupulously guarded, and upon any complaint (or without waiting for it if the child seems to be very near-sighted) the advice of a competent physician should be promptly sought, so that he may give fully and explicitly the proper directions for the treatment and care of the eyes, including, if the state of the case warrant them, the proper concave glasses. Concave glasses, being the reverse of convex, lengthen the focus to suit the (short-sighted) long eye. It is of peculiar importance that accurately-adjusted glasses should be worn in these cases, because they not only permit the removal of the book to a safe distance, thereby assisting greatly in checking the progress of the affection, but they also enable the child to imbibe unconsciously a vast amount of knowledge that would otherwise escape him. At the same time, being in a position to see and enjoy the world around him, he would be encouraged to use them on distant objects and get away from his books.

Astigmatism.—The explanation of this error is apt to be so confusing to any one not quite familiar with optics that I shall not weary

you, but will merely mention certain characteristic facts. The astigmatic person sees neither distant nor near objects distinctly, but he has the peculiarity of seeing lines running in one direction more clearly than others at right angles to them, and these lines are usually vertical and horizontal. He is apt to complain of all the symptoms of weak sight, probably in an exaggerated form, with an unusual amount of headache, and sometimes other nervous symptoms. Glasses accurately calculated, and made (as they must be) for the particular individual, render the sight acute, and are often of unspeakable comfort.

Old Sight cannot be considered, strictly speaking, as an optical defect, but it is merely one of the changes which come to us all with age. The lens of the eye becomes stiff and hard, less elastic than in our younger days, and consequently when the muscle of accommodation, which has also lost some of its vigor, slacks the sac holding it, it does not assume the convexity necessary for distinct vision of near objects. At the same time, distant vision remains as good as ever, because, as you remember, no adjustment is needed in the normal eye for distance. It usually makes its appearance between forty and fifty years of age. The first symptom is a disposition to hold the book or paper rather farther off or to seek a better light, especially at night. After a little the symptoms of weak sight come on, and for the same reason that they usually appear—viz. overstrain of the muscle, though this time it is not due to the shape of the ball, but the consistence of the lens. The remedy is found in convex glasses, which by shortening the focus assist the accommodation and relieve the strain. It is very important to put on glasses as soon as needed, to avoid this strain, not only as a matter of comfort, but because the overstraining of old eyes is thought to be one of the causes of a most serious and fatal disease of the eye.

Recapitulation.

In the preceding pages an attempt has been made to set forth, as simply and clearly as possible, certain facts of general interest and importance in regard to the eye, especially those bearing upon the exceedingly common and troublesome group of symptoms included under the general term "weak sight," and upon the nature and dangers of near-sight. The subject has been dwelt upon—to the point of tediousness, some will feel, I fear—because, while of very frequent occurrence, and when present very annoying, even to the extent of rendering the eyes practically useless, the nature of weak sight is not at all understood by most people, nor are they aware that it can in most cases be completely relieved by a very simple remedy. Neither

is it generally known that near-sight, often the result of preventable causes, is frequently associated with disease that may prove fatal to vision, and that special care is therefore required in its management. On the contrary, the popular opinion is that near-sighted eyes are strong eyes.

It has been shown that in the normal eye objects are seen by the formation of images or pictures of them through the instrumentality of the lens on the sensitive retina; that distant objects are seen clearly without effort, while near objects are made distinct, by a muscular effort, it is true—the accommodation—but one that can be made and kept up without fatigue; and that the two eyes are held upon near objects comfortably by the muscles of convergence. It has also been explained how certain departures from the normal in the shape of the eyeball will bring about an overstrain of one or both of these sets of muscles, causing weak sight, Attention was called to the short eye, causing over-sight or long-sight, as by odds the most frequent cause of weak sight, though certain nervous conditions, weakness of the muscles from sickness, and strain of the muscles of convergence in short-sight, were mentioned as being sometimes responsible for it. It has been further made plain that near-sight, or myopia, is the result of an elongation backward of the globe; that it nearly always originates during school-life or between the ages of six and sixteen; that it is often progressive in character, and is then associated with diseased conditions which may lead to total loss of sight; that its cause is too great tension or strain of the muscles of adjustment, resulting from too much study or from unfavorable surroundings, necessitating an overstrain by requiring too near an approximation of the object; and, finally, that it is largely preventable by proper care.

General Directions.

The directions for the proper use of the eyes follow, almost as a matter of course, from what has been said.

Always have plenty of light. Economy in light is very poor economy. Many of the most intractable forms of weak sight I have seen have resulted from the use of the eyes by a bad and insufficient light. Any good, white, steady light will answer, provided it is *bright* enough. The German student's lamp, looked at from every point of view, expense included, is probably the best light, but any good lamp with a large wick, that is kept clean and well-trimmed and filled with good oil, will do very well. Avoid flickering gas-jets. If you prefer gas, see that the flame is steadied by an argand burner or a transparent globe with

a large opening below. The light should come from behind and the left, so as to illuminate the page and not the eyes. Nothing is more irritating than a number of lights falling upon the eyes from different directions, as the jets in a church or public hall, and those with sensitive eyes should never attend such places at night without the protection either of dark glasses or a shade.

Never read by twilight. I have in mind now a young lady of prominence who, for one imprudence in this respect, forfeited the use of her eyes for months, not to mention the positive suffering she endured.

Do not read lying down. Owing to the position, the eyes are more than usually full of blood, and the muscles are unduly strained because of the practical impossibility of holding the book squarely before the eyes. For a similar reason, do not employ the eyes in a stooping position; it obstructs the return flow of blood from the head and eyes. "Carry the book to your eyes, and not your eyes to the book."

Eschew the pleasures of book or newspaper while riding, unless the vehicle be very steady. The work of adjustment is greatly increased by the shaking of the letters; the eye has "to take them on the fly," as it were, and it is very fatiguing. It should never be done, even on the smoothest railway, if the eyes are not perfectly strong.

Never sew on black at night. Black absorbs so much light that no ordinary artificial source can afford enough for its proper illumination.

Whenever the eyes become tired and uncomfortable stop work and rest them a while. If you persist in using them after the warning, you will be apt to suffer for it. If the fatigue and discomfort be so marked as to amount to weak sight, seek advice from some competent physician, who will nearly always put you in the way of obtaining permanent relief.

If old enough to wear specs, put them on as soon as you feel the need of them; which is to say when you catch yourself holding your book farther off in the day and abusing the lamp and the print at night.

Plenty of sleep is important. When the eyes are weak, it is a necessity. Should you have children, observe them while using their eyes, and if they hold the book too near or if they complain of them, examine into the matter carefully. By following the directions given at the end of this discourse, you can form some idea of the trouble yourself, though only the skilled physician can relieve it. Being ambitious and studious, do not urge them to still greater tasks for the

gratification of your own pride, and run the risk of irreparably damaging their eyes or ruining their health for life; but judiciously curb their enthusiasm, impressing upon them the important truth that the sound body is as necessary as the cultivated mind. I have been shocked at the folly sometimes exhibited by parents in this respect.

Glasses.

Glasses for the young, owing to the peculiar character or the serious nature of the defects occurring among them, should always be selected by some one thoroughly familiar with the subject. Says a well-known writer: "The selection of glasses for short-sight requires great care, as much harm may be done by using those that are too strong or that are not properly fitted to the eye. In many cases the plan of 'trying' the various glasses on the optician's counter—or, far worse, in the peddler's box—is about as rational and safe as it would be, in case of sickness, to *try* the contents of the various bottles on the druggist's shelf without a prescription." But in old sight it is not so serious a matter, and at the end I append a simple rule for the selection of such glasses that may prove a help to some of my readers.

Spectacles are, as a rule, better than eye-glasses, because the lenses are kept in the right position more easily, though the latter are often very handy, especially when the specs become mislaid, as they frequently do when not worn constantly. In such cases, if expense be not an item, it is very convenient to have both. The frames are a matter of taste only, provided they fit the face properly, so as to put the centre of each lens opposite each pupil and the right distance from the eye. Steel frames are most generally worn, but for constant use in summer some non-corrosive material is better, and even gold is more economical in the long run.

All glasses are equally good, provided they are equally homogeneous and transparent, the only difference between them being in the curvature of their surfaces. "Pebbles," while much more costly, have no special virtues over glass, other than greater hardness, and consequent less liability to scratch, and a little less weight in the higher numbers. Quite often they are much inferior to glass, because, being cut from a natural and peculiar product, fluor-spar, they must be made with great care or they are much worse than glass, and that care is not always bestowed on them. Be not deceived by the oily-tongued venders of spectacles travelling through the country. The truth is not in them, and they usually charge from two to ten prices. If you are so unfortunate as to need glasses, and feel equal to selecting them for yourself,

buy them from some optician or jeweller in your nearest town whom you *know* to be a man of character.

From $1.50 to $2.50 is ample for the best glasses in good steel frames, and from $5 to $10 in gold, unless the lenses be of the peculiar kind required in astigmatism or a combination of different sorts.

Blindness.

In considering the care of the eyes in its relation to blindness, we must deal with the diseases and injuries to which they are liable. For a thorough exposition of the subject volumes would be required, such has been the progress in this branch of medicine; but of course in a publication of this kind it is only intended to call attention to certain facts in connection with them that ought to be in the possession of everybody, as a general knowledge of them would annually save this most precious of the senses to very many.

Having already, in the first division of our subject, dwelt upon the diseased conditions associated with near-sight which sometimes cause the loss of vision, no further allusion will be made to them.

By long odds, the most frequent of the diseases practically interesting to us is an inflammation of the delicate membrane covering the front of the ball and lining the under surfaces of the lids, called the *conjunctiva.* There are many varieties of this, but the symptoms common to all of them are redness of the eyes with more or less swelling of the lids and a discharge of mucus or matter. The severity of these symptoms is an index of the gravity of the attack. The discharge is *highly contagious*, and, as the matter from a mild case may excite an attack of dangerous severity in another, the most scrupulous cleanliness should be observed, and no one should be permitted to use the same washbowl or towels as the patient.

A familiar illustration of this class of diseases is the common "sore eyes" which goes through the country every few years, and which, it may interest you to know, is technically known as catarrhal conjunctivitis or catarrhal ophthalmia. It is generally of a mild type, with a tendency to recovery, and is, for the most part, treated without the aid of a physician, and usually with success. But just here I must sound a note of warning against the use of any preparation of *lead.* I mention this, because if the clear "watch crystal" becomes ulcerated, as it sometimes and not very infrequently does in this disease, the lead becomes deposited on the rough surface of the ulcer in the form of its insoluble carbonate, or white paint. It sticks so closely that it cannot be satisfactorily removed without damaging the eye, and is occasionally

the cause of its total loss. I have seen a number of such cases. A popular old remedy known as "Thompson's eye-water" is said to be one of these lead preparations, and should never on that account be used, as it cannot be predicted when these ulcerations may occur. Any simple astringent, as alum-water, a teaspoonful to a pint, or borax-water, twice as strong, a few drops in the eyes three or four times a day, or simply bathing the closed eyes for fifteen or twenty minutes at a time several times a day with water as hot as can be borne, will answer; but if the eyes become decidedly painful and sensitive to light, and especially if the transparent part appear smoky or rough, seek your physician immediately, as the eye is in danger and more careful treatment is necessary.

The gravest of this class is the inflammation which comes on during the first week of life, usually in the first three or four days after birth. It is the most frequent cause of hopeless blindness, *30 per cent.* of the inmates of the blind asylums of Great Britain having lost their sight from it, and in the United States *32 per cent.* of those blind from preventable disease tracing to it. And the pity is the greater because it is very amenable to proper treatment, and this fearful loss of sight must therefore be largely attributed to either ignorance or neglect. It can be easily recognized by the symptoms common to the class mentioned in the beginning—viz. redness and swelling of the lids, with a *discharge of matter*, occurring shortly after birth. In view of its dangerous and, in bad cases, rapidly destructive character (twenty-four to forty-eight hours sometimes sufficing to compass the loss of the sight), no time should be lost in trying breast-milk, rotten apple, tea-leaves, alum curd, or other infallible remedies of the monthly nurse, but the physician should be called *at once*. But do not sit idly by doing nothing until he comes, for good doctors are apt to be busy men, and it may be several hours or longer before he can get round, especially if it be in the country, and the child's sight may be lost in that time. The first thing to do, if only one eye be affected, is to try to prevent the infection of the good one by matter from the first, and the simplest method of doing this is to seal up the good one. Put a piece of soft clean cotton over it, and cover the whole with sticking-plaster, special care being taken to see that it is securely glued down on the dangerous side. For the same reason the child should, as far as possible, lie on the affected side and the hands should be secured. But both eyes are nearly always involved from the beginning. As cleanliness is the most important part of the treatment, set to work to cleanse, and *keep* the eyes clean, repeating the washing as often as every half hour if necessary.

Separating with the thumb and forefinger of the left hand the lids of the lower eye (the child lying on his side), let a stream of the borax- or alum-water, mentioned above, from a sponge or cloth saturated with it run between them upon a folded towel previously placed under that side of the head, and repeat until the matter is all washed out. After the doctor comes attend carefully to his directions, and *carry them out to the letter day and night*, for in the bad cases of this disease eternal vigilance is the price of sight.

In all those eye troubles characterized by a dread of light, watering of the eyes, particularly on exposure, and pain, especially if it extend to the brow, temple, side of nose, and perhaps run up into the head, very important structures are almost surely involved and medical aid should be obtained without delay. Irreparable damage may result from waiting only a few days.

Elderly persons who observe rings or rainbows around the lamp, and who suffer from occasional attacks of dimness of sight, are threatened with a disease known to oculists as *glaucoma*. Should the dimness persist for twenty-four hours, especially if accompanied by pain in the eye or head, let not another day pass without obtaining skilled advice. The results of *prompt* treatment are among the most brilliant in surgery; absolute and hopeless blindness, often accompanied by great pain, is the consequence of neglect.

Cataract is the most common cause of curable blindness. It is simply a cloudiness or opacity of the crystalline lens, so that cataract is *in* the eye, not *on* it, as we often hear it said. It may occur at any time of life, but nearly always at the two extremes, being often congenital, but usually one of the results of age. A gradual failure of sight, presenting the peculiarity of being better in a dim than in a bright light, at twilight than in the middle of the day, is very suggestive—quite characteristic indeed of certain partial cataracts occurring in the young; but the nature of the disease is rendered certain by the appearance of the pupil, which, instead of being black as in health, is gray or white. The pupils of all old persons are somewhat grayish, from the natural hardening of the lens, but their sight is good. The blindness is relieved by the removal, by a delicate surgical operation, of the opaque lens; and such has been the progress in this branch of medicine that, taking the average, over 90 per cent. are restored to sight. It is peculiarly important that the cataract of infancy and childhood should be removed during that period of life, because by obstructing the light it prevents the development of the nervous apparatus of the eye from want of exercise. Neglect to have it done is the

more inexcusable on the part of parents because the operation is not a difficult one, and is not often followed by bad results.

Tobacco Amaurosis is a form of blindness that results from the excessive use of tobacco. It is an affection of the optic nerve, and there are no visible changes in the eye, the only symptom being a gradual failure of sight. Abandoning the habit, sight is almost sure to return under a tonic treatment.

Floating Specks—or *Muscæ Volitantes*, as they are technically called—are small spots of various shapes, or more or less translucent bodies, singly or in strings like beads, which are seen floating about in the field of vision upon looking at a bright surface. They are merely shadows cast upon the retina by minute opacities in the vitreous humor, and, sight being good in other respects, they mean nothing. Any one can see them by looking at the sky or a white wall through a pin-hole in a card.

Color-Blindness is a peculiar affection which, while it may be caused by disease, is generally congenital. Sight for ordinary purposes is of normal acuteness, but certain colors, most commonly red or green, cannot be correctly distinguished. It is very much more frequent among men than women (3 or 4 per cent. to much less than 1 per cent.). Practically, it is interesting and important in its relation to the employees of railways and steamboats, who are governed by colored signals. The question of life and death being involved in the correct reading of the signals, all such employees should be carefully tested in this respect before being taken on.

Accidents and Injuries.—Certain wandering denizens of the air, such as moths, cinders, gnats, etc., frequently find their way into the eyes, and few of us have not felt "what small things are boisterous there." Entering with comparatively little force, they are not imbedded in the tissues, but are usually found lying between the ball and one or the other lid, generally the upper. This being so, they are sometimes very easily removed by pulling down the upper lid over the lower, so as to wipe the under surface of the former by the lashes of the latter. Failing in this, it is not worth while to waste time on flaxseed, the popular remedy—which acts, if at all, by getting between the lid and ball, lifting it off, thereby giving the tears a better chance to wash the foreign body out—as prompt relief can nearly always be secured by a little simple manipulation on the part of a friend. It is done in this way: Place the point of an ordinary lead-pencil or other small rod horizontally on the upper lid about half an inch from its edge; grasp the lashes firmly with the other hand, hold the pencil steady, tell the patient to "look

down," and just as he does so turn the lid quickly over the pencil, and, nine times out of ten, you will find the mote or cinder sticking to it. Having found it, wipe it gently off with either a handkerchief, a twisted piece of paper, or, best of all, a small soft brush made by wrapping a little cotton around the end of a match.

Workers in metal and stone are liable to more serious invasions by flying fragments of the material in which they work. These minute pieces of steel or stone fly off with so much force that very often they are imbedded in the clear front of the ball. An attempt may be made to remove them with the brush just spoken of or with a bluntly and smoothly-pointed stick of soft wood; but if it is not easily and quickly done a more skilful hand should be sought, as repeated efforts might seriously damage the transparent cornea. Prevention being better than cure, such artisans should always wear while at work strong eye-protectors.

Quite often these foreign bodies are of sufficient size, and strike the eye with force enough, to penetrate its walls and let out some of its humors, the most common being fragments of gun-caps and splinters of wood which fly up in chopping. Injuries of this character are of such serious import that no intelligent person would fail to shift, as soon as possible, the responsibility on his medical attendant. There is sometimes in these cases a special reason for seeking his help. If the cut through the coats lie in what is called the "dangerous region," which is a belt of the white of the eye about one-eighth of an inch wide lying immediately around the colored part, and especially if the missile be still within the ball, there is great danger of exciting in the sound eye the dreaded sympathetic disease, which, when once established, is practically hopeless, causing nearly always complete and irremediable loss of sight.

Not seldom the eyes are injured by caustics of one kind or another, the most frequent being unslaked lime in fresh mortar. In such cases a little castor or sweet oil should be immediately dropped into the eye, and then the lime washed out with water.

Tests of Vision.

In the types below numbered 1 and XX. we have the tests respectively for near and distant vision. The perfect eye should distinguish No. 1 at one foot, and No. XX. at twenty feet, the retinal images of the two being of the same size at those distances.

The power of accommodation being normal, No. 1 should be read, with an effort, as near as three inches at the age of ten; four inches at

twenty; five and one-half at thirty; and eight at forty. When this "near point" recedes beyond nine inches, which it usually does about forty-five, it is time to put on spectacles. The rule for their selection is simply, in a few words, to put on a convex glass strong enough to bring it up again to nine inches. If nearer than that, the glass is apt to be uncomfortably strong, while if it is not brought within ten inches it is not likely to afford complete relief, especially at night, when a rather stronger lens is needed than will answer under the brilliant illumination of daylight.

A person who can read No. XX. at twenty feet, and cannot read No. 1 as near as he ought at his age, is almost certainly moderately far-sighted.

One who can read No. 1 as he ought, but cannot make out No. XX., is moderately near-sighted. If No. 1 be very distinct at a nearer point than one foot while distant vision is very bad, the person has myopia of a higher degree.

One who can distinguish neither at the proper distance is either astigmatic or very far-sighted—or over-sighted, as now appears to be the better term—or very near-sighted. In astigmatism and far-sight both near and distant vision are relatively much the same, equally good or bad. In high degrees of near-sight distant vision is proportionally very much worse.

No. 1.*—DIAMOND.

The place of our retreat was in a little neighbourhood, consisting of farmers, who tilled their own grounds, and were equal strangers to opulence and poverty. As they had almost all the conveniences of life within themselves, they seldom visited towns or cities in search of superfluities. Remote from the polite, they still retained the primaeval simplicity of manners; and frugal by habit, they scarce knew that temperance was a virtue. They wrought with cheerfulness on days of labour, but observed festivals as intervals of idleness and pleasure. They kept up the Christmas carol, sent true-love knots on Valentine morning, ate pancakes on Shrove-tide, showed their wit on the first of April, and religiously cracked nuts on Michaelmaseve. Being apprised of our approach, the whole neighbourhood came out to meet their minister, dressed in their fine clothes, and preceded by a pipe and tabor; a feast also was provided for our reception, at which we sat cheerfully down; and what the conversation wanted in wit,

XX.

Y A C E G L

* This type is really 1½ and should be read by the normal eye as far as one foot and a half, but practically it will answer very well.

THE CARE OF THE EARS.

CONSIDERING man merely as a constituent element of the community, deafness is not so serious as blindness; but in its relation to the happiness of the unfortunate individual it is generally regarded by those having opportunities of observation as the worse of the two.

The deaf never receive the sympathetic consideration universally accorded to the blind on account of their physical helplessness, but, on the contrary, are often treated with impatience, if not with positive harshness. In addition, they are frequently harassed by subjective sensations—noises of various kinds, "so exquisitely distressing," says Politzer, the greatest authority on the ear, "as to undermine often both the physical and moral powers of the individual, and in some cases even to lead to suicide." Their dispositions suffer in consequence, and they are apt to become sensitive, suspicious, and reserved. This is peculiarly the case with those who lose their hearing in childhood while their moral natures are even more soft and pliant than their physical bodies. So deafness is very much more of an affliction than those with good hearing are prepared to admit.

The ear is made up of three divisions: a sound-collecting, a sound-transmitting, and a sound-receiving apparatus,

With the first of these every one is familiar in the peculiarly-shaped external ear or auricle. The waves of sound, having been collected by this, traverse the auditory canal, which is about an inch and a quarter long, and fall upon a delicate membrane stretched tightly across the inner end of it. This, in ordinary conversation, is often spoken of as the "drum of the ear," but it is, in fact, only the drum-*head*, or tympanic membrane, the drum being a cavity with other parts in addition. Fastened to the inner surface of this drumhead is the first of a chain of three tiny bones, called the hammer, the anvil, and the stirrup, from their resemblance to those objects, united, as other bones, by joints (which sometimes, like them, become stiff) that extend across the drum-cavity. The end of the last one, the foot of the stirrup, fits into an oval hole in the inner bony wall of the drum, which is the outer wall of the labyrinth. It lies immediately in contact with the fluid

filling the labyrinth or inner ear, the sound-receiving apparatus, in which fluid the ends of the nerve of hearing are bathed.

The waves of sound striking against the taut drumhead, it is thrown into vibrations, and these vibrations are transmitted through the chain of bones to the fluid, and through that to the nerve. This, in brief, is the mechanism of hearing.

Connecting the drum with the throat is a small and crooked tube, about an inch and a half long, called the Eustachian tube. This tube, as well as the drum itself, is lined with the same mucous membrane that covers the throat. Indeed, the drum is, anatomically considered, an offshoot from the throat. Such being the case, we would naturally expect the drum to suffer with the throat in disease. And the facts bear out the anticipation. Fully three-fourths of all cases of deafness are attributable to affections of the drum or conducting apparatus that are almost invariably associated with similar disease in the throat. Although persons hard of hearing may not complain of the throat, it very rarely happens that trouble cannot be found there if looked for. When we remember how exceedingly common colds and sore throats are, bearing in mind that the back part of the nose is a part of the upper throat, into which the Eustachian tubes enter, it is very evident why this form of deafness is so frequent.

Inflammations of mucous membranes are always accompanied by swelling or a discharge of mucus, generally both ; and, keeping these facts in view, it is very easy to understand how these troubles cause deafness. The purpose of the Eustachian tube is to keep the drum full of air, and Nature has provided that it shall open every time we swallow or yawn, so that the air may enter easily if there be need for it. You have no doubt often felt the air rush into the ears when blowing your nose violently, and felt a roaring in them when gaping widely.

Sometimes in fresh colds the membrane surrounding the mouth of the tube becomes so swollen as to close it, or it becomes stopped by a plug of mucus, and then deafness results, because the air in the drum is partially absorbed and cannot be replaced. In these cases, when the tubes are opened, the restoration of hearing is often magically instantaneous. It occasionally happens that hearing suddenly returns of itself with a sudden snap. The swelling, however, is not always, or even generally, restricted to the *mouth* of the Eustachian tube, but involves the length of the tube and the drum itself. Of course swelling in these situations, and especially the presence of a viscid fluid in so delicate an instrument as the drum, must seriously interfere with its proper working. In the acute forms of these troubles relief can generally be af-

forded, but when they are allowed to become chronic the changes in the tube and drum often assume a permanent character, and complete restoration to hearing is then impossible.

The moral to be drawn from this is, that deafness should be treated promptly in the beginning, before irreparable damage is done. This is peculiarly true of these troubles occurring in children, as they are then exceedingly amenable to treatment, while their neglect is liable to eventuate in permanent impairment of hearing.

In this connection it is proper to make a suggestion to teachers in regard to deaf children. They are necessarily at a great disadvantage on account of their infirmity, and are often accused of stupidity or inattention when the truth is they cannot hear. So, whenever there is any reason to suspect such a thing, carefully test the hearing by conversation across the room with the child's back to you, beginning with a whisper and gradually raising the voice, making him repeat each word after you. Ascertaining those who are deaf, seat them nearest to you, and *be patient with them*, remembering that one of the frequent results of deafness and its accompaniments is an injurious effect upon the disposition, and that probably under similar circumstances you would not be amiable.

Earache, a familiar enemy in most families with children, is generally due at first to a congestion of the lining membrane of the drum, and can usually be promptly relieved by *heat*. The heat may be applied in various ways—by cloths wrung out of hot water, raw cotton heated by application to the surface of a tin vessel filled with boiling water, flannel bags of salt or sand heated in an oven, or, best of all, a steady, gentle stream of water, as hot as it can be borne, for twenty or thirty minutes, into the aural canal. Sometimes simply breathing into the ear will give relief. The old-fashioned remedy of a boiled onion is not a bad one, but never apply poultices to the ear: they are liable, while giving temporary ease, to do eventual injury. Abjure spirits of camphor, kerosene, and such remedies; they do no good, and may do harm. If heat fails, call in your physician, and he may try the celebrated new remedy cocaine, which sometimes succeeds in relieving pain in the ear, though it often fails, being by no means so satisfactory as in eye troubles.

The earache being neglected, and the congestion of the lining membrane of the drum going on to inflammation, mucus is poured out just as it is from the nose in a fresh cold. The Eustachian tube being also swollen, the mucus cannot escape by that, which is the only avenue, and so it accumulates, causing fearful pain, until by pressure upon the delicate drumhead it brings about its ulceration and perforation, allow-

ing the mucus, which soon changes to matter, to find its way out through the external canal.

Otorrhœa—which means a running from the ear—is the technical name given to this state of things, and the cause of it, above set forth in detail, is commonly called "a rising in the head." You will note that a hole in the drumhead is one of its constant features. Notwithstanding the great damage to the ear, it is, owing to its common occurrence and to the fact that some cases do get well (that is, the running stops) without any special treatment, often looked upon by parents, and occasionally by physicians who have not quite kept up with the times, as a trifling matter, their advice in such cases being, "Let it alone and he will outgrow it." But it is by no means a trifling matter. If neglected, the pus lying in the canal decomposes and becomes very offensive, making the poor child a stench in the nostrils of his associates. To illustrate to what extent this neglect has been carried in some few instances, it may be mentioned that living maggots have been found in the ear. Another consequence of a want of attention is much greater deafness than would have followed prompt treatment. But the evil effects of neglect of a running from the ear do not always end here. The disease may extend to the bone, and thence to the brain, the dividing-wall between the ear and the brain being exceedingly thin, and cause *death.* The wonder is that more fatal cases are not recorded, and, as it is, those who are not familiar with the subject would be shocked to know how many die from this cause. It need not be said, therefore, that they should always receive medical attention. The treatment is simple and the services of a specialist are not usually required, any well-informed physician being competent to undertake most of them. There certainly can be no excuse for not keeping them clean by daily syringing out the ear with warm water. All applications to the ear should be *warm.*

Wax, or a compound commonly called by that name, is a natural secretion of the walls of the aural canal of a yellowish-brown color and peculiar odor, the purpose of which, it is supposed, is to repel wandering insects. Quite often it accumulates until, by blocking up the canal, it causes deafness; which, by the way, generally comes on with more or less suddenness. It can generally be seen as a dark mass by an inspection before an open window, the auricle being pulled upward and backward to straighten the canal. It should always be removed, as its presence in a hardened mass is apt to prove injurious. Fill the ear nightly with warm soda-water (a teaspoonful of cooking soda to a tumbler), letting it remain fifteen or twenty minutes for three or four nights, to soften

the wax, and then syringe somewhat forcibly with warm water. But, unfortunately, this syringing of the ear is not as simple as it sounds, nor is it entirely safe in inexperienced hands; so it is best to go to your doctor at once, especially as other changes are often associated with this accumulation which will need attention.

Insects of various kinds frequently get into the ear, and by scratching the exquisitely sensitive drumhead with their claws often cause frightful pain and the most terrific noises. (I was called from my bed early this morning to relieve marked distress occasioned by so harmless a thing as a common house-fly.) When the presence of an insect is suspected, the ear should be filled with warm water, which will either run him out or drown him.

Foreign bodies, such as beads, peas, cherry-stones, etc., in the aural canal "should never be touched by incompetent hands." If they cannot be shaken out by jarring the head, the aid of an expert should be obtained, as a number have lost their lives from badly-directed attempts to remove them.

Injuries to the ear, through rupture of the drumhead, sometimes result from the violent concussion due to a loud explosion, as of a large cannon. Now and then it is a consequence of a concussion of a more homely and every-day character—to wit, a box on the ear. As "there are a few well-authenticated instances of death having occurred from this barbarous custom," it is superfluous to add that it is "more honored in the breach than in the observance." The drum is sometimes injured by sharp instruments, such as hairpins, knitting-needles, toothpicks, etc., and my reader is warned against scratching the ear in any such way. Never put any instrument in the ear except your finger; you cannot get that deep enough to do any harm.

Before concluding, I must again direct attention to the importance of looking after those every-day troubles earache and "rising in the head." To their neglect are attributable a great many cases of incurable deafness, and some of death.

Dec 27 1934